WORKSAFE
Mahi Haumaru Aotearoa

HSWA

QUICK GUIDE

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Industrial vacuums and portable extractors for hazardous dust

This guidance advises PCBUs how to choose, use and maintain industrial vacuums and portable extractors for controlling hazardous dust at work.

Some of the most common construction and manufacturing jobs can create high levels of hazardous dust.

The more hazardous the dust, the more important it is not to be breathed in.

As a PCBU, you have a duty to eliminate risks. If this is not reasonably practicable, use the hierarchy of control measures to minimise risks as much as possible.

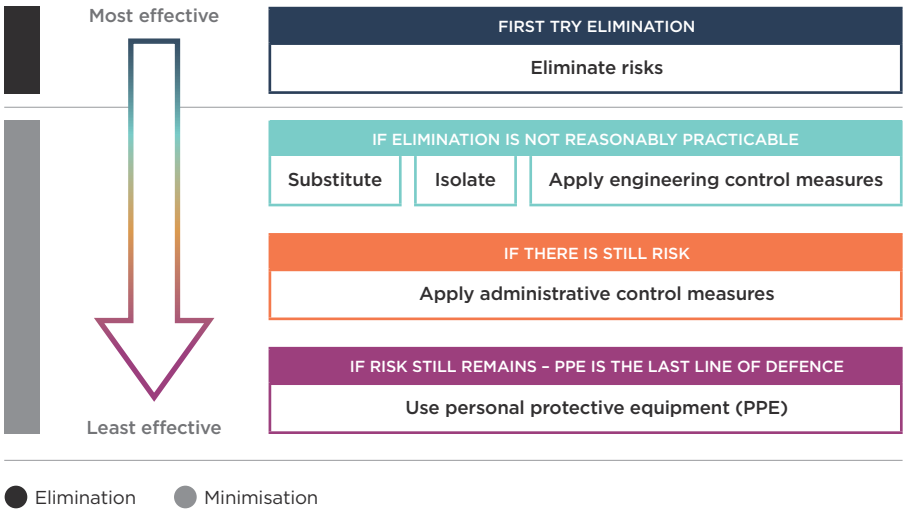

FIGURE 1: Hierarchy of control measures

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There are different ways of eliminating or minimising dust exposure to workers, and other people in the workplace, such as visitors. One possible method is to use wet processes for cutting and grinding. Wet processes effectively reduce the amount of dust generated and help prevent dust from becoming airborne.

Using an industrial vacuum cleaner to vacuum up dust once it has settled is an example of an administrative control measure. This prevents the accumulation of hazardous dust.

A better method than using an industrial vacuum to minimise exposure to dust is to use power tools connected to a portable dust extractor or to a fixed local exhaust ventilation (LEV) system. These are engineering control measures that capture and remove dust from the point of generation, as it is generated.

LEV systems offer protection from dust and other contaminants, by transporting them away from the worker's breathing zone.

- For more information about LEV systems, see our guidance Local exhaust ventilation
- For more information about on-tool extraction, see our guidance Controlling dust with on-tool extraction

However, if you decide to use industrial vacuums and portable extractors for controlling hazardous dust, this guidance will help you understand how to select and use these devices safely.

Risks presented by breathing in hazardous dust

Breathing in hazardous dust can cause diseases such as:

- lung or upper respiratory tract cancers
- chronic obstructive pulmonary disease (COPD)
- asbestos related diseases
- silicosis (including accelerated and acute silicosis).

Choosing the right type of vacuum

Industrial vacuums and portable dust extractors used for hazardous dusts must be fit for purpose. This is to make sure the dust is safely captured and contained.

Domestic-rated, or standard commercial vacuums, do not provide a suitable level of protection against hazardous dust. These types of vacuums should not be used in industrial environments, regardless of the type of filter fitted.

Note: High-efficiency particulate air (HEPA) does not mean H-class.

Industrial vacuums rated for use with hazardous dusts are classed L, M or H. These letters refer to the hazard rating: light, medium, or high hazard.

M-class and H-class vacuums have safety features which include:

- the safe removal of dust collection bags
- an alarm indicator if the airflow falls below 20 cubic metres per second
- prevention of accidental opening and release of dust when not in use.

An H-class vacuum is required for managing dust exposures in the engineered stone benchtop industry as well as the removal of respirable crystalline silica (RCS) and dusts that may contain RCS. H-class industrial vacuums are also required for the removal of asbestos contaminated dust and debris. See Table 1 below for more information.

In the unlikely instance it is not reasonably practicable to use an H-class industrial vacuum, you should undertake a robust health risk assessment to support this decision. This should include an assessment of current control measures, personal exposure monitoring, and the frequency and duration of exposure.

Selecting the right class of filter

Filters for use with hazardous dusts are classified according to their filtration efficiency. Filters must:

- be designed to fit the model of vacuum cleaner you are using
- achieve the same filtration efficiency the vacuum cleaner is rated for (or higher).

For example, if the work requires use of an H-class industrial vacuum cleaner, you will need a filter that has the appropriate level of filtration efficiency.

Maintaining your industrial vacuum

Industrial vacuums should be maintained according to the manufacturers' guidance. When cleaning your vacuum, you should:

- wear personal protective equipment (PPE) as required, including appropriate respirators (which have been fit-tested to ensure a good seal around the face)
- seal or cordon off an appropriate area to prevent unnecessary dust exposure to others
- make sure the dust bag has been removed and disposed of first
- use a damp cloth to clean the dust off the outside of your vacuum, and any inside parts you can access
- dispose of dust and containment bags and contaminated damp cloths appropriately and in tightly sealed bags or containers.

For a more thorough clean you can also clean it using another industrial vacuum cleaner. Only use this method if the other vacuum cleaner is rated at the same class, or higher.

Dry brushing or using compressed air should never be used to clean vacuums. These methods cause hazardous dust to spread and become airborne. Compressed air can also damage filters, making them ineffective.

Fit-testing for respirators should be conducted by a competent person. For more information on fit-testing, see our guidance Respiratory Protective Equipment (RPE)

Note: Where the industrial vacuum has been used for **asbestos**, removal and disposal of the contents must be done by a **competent person**.

For **asbestos**, **RCS and other hazardous dust**, removal and disposal of the contents should be carried out in a controlled environment, with control measures in place, wearing appropriate PPE and RPE, and in compliance with the manufacturer's instructions.

Asbestos waste must be clearly labelled as containing asbestos and can only be disposed of at authorised disposal sites. Check with your local authority on where these are and any requirements they may have.

Worker information and training

Workers must be provided with information, instruction, and training on how to use industrial vacuum cleaners. Workers should also understand:

- the types of hazardous dusts they are working with, and the associated health effects
- that hazardous dusts should never be removed using compressed air or dry sweeping methods
- why a particular class of vacuum cleaner has been selected
- the type of filter required for the class of vacuum cleaner being used
- the maintenance and testing requirements of the vacuum cleaner
- how to safely transport vacuum cleaners contaminated by hazardous dust
- how to dispose of waste appropriately.

Considerations when capturing dust released from power tools

When using industrial vacuum cleaners, or on-tool dust extraction systems, the following considerations should be made:

- make sure the machine has sufficient power and capacity to keep up with the amount of dust, and the speed at which it is generated
- where the tool ejects material, such as in rotational cutting or grinding, make sure appropriate dust collection shrouds, hoods and guards are used, and placed effectively
- for power tools connected to dust extraction, select systems where dust extraction starts automatically when the tool is switched on
- for heavy dust loads, an in-line dust separator (cyclone) between the tool and the filter, can help extend the life of the filter.

Hazardous dust class and specialist advice

Table 1 below provides guidance on the hazardous dust class of materials or substances. The WorkSafe New Zealand special guide Workplace exposure standards and biological exposure indices should be used as a source of WES-TWA[1] when determining the class of hazardous dusts. A competent person may assist you in making these interpretations.

A competent person is regarded as a person who has acquired through training, qualification or experience, the knowledge and skills to carry out a specific task. Where specialist assistance is required, a competent person, such as those listed on the HASANZ Register may be able to help you.

[1] WES-TWA (Workplace exposure standards – time weighted average) is the average airborne concentration of a substance when calculated over an eight-hour working day.

HAZARDOUS DUST CLASS	REQUIRED FOR	FILTRATION EFFICIENCY OF THE VACUUM CLEANER
L (light hazard)	Dusts with a workplace exposure standard value greater than 1mg/m³ (8-hour WES-TWA). Examples include: – carbon black – cellulose (for example, paper dust) – non-carcinogenic synthetic mineral fibres (for example, insulation).	99% filtration efficiency
M (medium hazard)	Dusts with a workplace exposure standard value greater than or equal to 0.1mg/m³ (8-hour WES-TWA). Examples include: – silver dust – cotton dust – flour dust.	99.9% filtration efficiency
H (high hazard)	Dusts with a workplace exposure standard value less than 0.1mg/m³ (8-hour WES-TWA) including carcinogenic dusts and dusts contaminated with carcinogens and/or pathogens. Examples include: – respirable crystalline silica (RCS) – lead dust and fumes – asbestos-contaminated dust.	99.995% filtration efficiency

TABLE 1:
Examples of hazardous dusts and the required class of industrial vacuum

More information

Local exhaust ventilation

Silica dust in the workplace

Wood dust: controlling the risk

What you should know about working with asbestos

Hazardous waste

Health and exposure monitoring

Providing information, training, instruction or supervision for workers

Acknowledgements

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